USSR

UDC 669.28

FREZE, N. I., BIRYUKOVA, T. A., and MURZINOV, N. A.

"Feautes of Melting Alloys of the Mo-C-Ni System"

Moscow, Tsvetnyye Metally, No 7, Jul 72, pp 81-83

Abstract: The purpose of this work was to study the effect of melting method on the loss and distribution of nickel in the cross section of ingots of alloy TSM-3 (0.01-0.10% Ni, 0.05-0.10% C, balance Mo). The cold brittleness temperature of the cast metal was also studied. Ingots were melted in an electron-beam furnace and in vacuum-arc furnaces operating on d-c and a-c current. For electron-beam melting an 80-mm-diameter crystallizer was used. A 110-mm-diameter crystallizer was used for electric-arc melting. In the process of electron-beam melting of the electrodes, a large nickel loss resulting from vaporization and segregation throughout the ingot was observed. Use of electrodes made of alloyed nickel and carbon pellets made it possible not only to reduce nickel loss during melting but also to significantly improve the uniformity of nickel distribution. Arc melting in a "dry" crystallizer using d-c current led to an extremely nonuniform distribution of nickel in the cross section of the ingot caused by condensation of the vaporizing nickel on the crystallizer walls, enriching the surface layers. When a-c current was used
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FREZE, N. I., etal, Tsvetnyye Metally, No 7, Jul 72, pp 81-83

for arc melting, very little nickel segregates, owing to the constant infusion of the molten ingot.

Ingots obtained from a single electric-arc remelt exhibited an almost complete absence of nickel segregation. The nickel loss here amounted to 80-85%, but the high concentration content of oxygen in the electrode increased the oxygen content in the ingots (up to 0.007%). The use of combined electrodes (unalloyed pellets of high-purity Mo and Mo pellets alloyed with carbon as well as nickel plate) helped to lower the content of gas impurities. Cold brittleness of alloy TSM-3 was determined from the change in bend angle in which the temperature of transition from ductile to brittle was taken as the minimum temperature at which samples could be bent 90°. The alloy produced by electron-beam melting had the lowest cold brittleness temperature, while the alloy produced by single electric-arc remelting had the highest transition temperature. It was established that the higher the rate of crystallization, the higher the degree of solid solution saturation by interstitial elements and the higher the cold brittleness temperature. 3 figures, 1 bibliographic reference.

2/2

Heat Treatment

USSR   UDC 621.791.856:669.28

ALEKSEYENKO, G. N., NERODENKO, M. M. (Electric Welding Institute imeni
YE. O. PATON, Academy of Sciences Ukrainian SSR), BIRYUKOVA, T. A.,
DANIYELYAN, T. A., MAL'TSEV, M. V., FREZE, N. I., and SHCHUKIN, A. A.
(Moscow)

"Effect of Heat Treating on the Properties of Molybdenum-Carbon-Nickel
Alloys and Their Weld Joints"

Abstract: The study deals with the properties of intermediate products
from TSM-3 structural molybdenum alloy (0.05-0.10% wt % C and 0.01-0.10%
Ni) following annealing. The specimens were tensile-tested at room
temperature, at $2.5 \cdot 10^{-3}$ sec^{-1} deformation rates and were arc-welded in
a controlled inert-gas atmosphere. The specimens were pre-annealed for
1 hour in vacuum (10^{-5} mm Hg) at 800, 1100, 1200, 1300, 1400, 1500, 1600,
and 1700°C. Metallographic examinations indicate that recrystallization
begins at 1200°C and is completed at 1400°C. Maximum plasticity was shown
by specimens with a completely recrystallized structure. Pre-annealing
appears to upgrade the weld quality. Nickel tends to concentrate along
the grain boundaries and not only hinders carbon diffusion, but also
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ALEKSEYENKO, G. N., et al, Avtomaticheskaya svarka, No 4, Apr 72, pp 47-49

promotes strengthening of the metal bond in the boundary layers owing to
the localized increase of electron concentration. This strengthening
of grain boundaries by nickel appears to be the determining factor in
raising the plasticity of TSM-3 alloy in recrystallized state. (2
illustrations, 3 tables, 4 bibliographic references)

2/2

USSR

UDC 621.791.011:669.28

GUREVICH, S. M., NERODENKO, M.M., ALEKSEYENKO, G. N., Institute of Electric Welding imeni Ye. O. Paton, Academy of Sciences, Ukrainian SSR, BIRYUKOVA, T. A., and SHCHUKYN, A. A., Moscow

"Weldability of Some Molybdenum Alloys"

Kiev, Avtomaticheskaya Svarka, No 3, Mar 71, pp 27-29

Abstract: A study was made of the weldability of molybdenum alloyed with carbon and group VIII elements (iron, cobalt, nickel, and irridium). The test procedure is described, and the mechanical properties of welded joints of the molybdenum alloys are tabulated. It was found that iron, cobalt, nickel, and irridium refine the structure of the weld. Group VIII elements increase the difference between the ultimate strength and yield point of joints made of alloys of molybdenum with carbon. In the entire investigated range of concentrations of these elements, the ratio $\sigma_{0.2}/\sigma_b$ during bending is minimal for joints of molybdenum-carbon-nickel and molybdenum-carbon-irridium alloys. With an increase in iron content the ultimate strength of the joints of 1/2

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GUREVICH, S. M., et al., Avtomaticheskaya Svarka, No 3, Mar 71, pp 27-29

molybdenum-carbon-iron alloys increases.

The mean hardness of welded joints of molybdenum alloys with δ = 1 mm at various distances from the weld is plotted. These data show that an increase in hardness along the axis of the wled and a decrease at the fusion line are especially characteristic for alloys of the molybdenum-carbon system. Group VIII alloying of molybdenum with carbon leads to a smoother variation of hardness with respect to joint cross section; irridium and nickel have the most favorable effects.

2/2

Acc. Nr.
AA0108179

Abstracting Service:
CHEMICAL ABST. 6-70

Ref. Code
 uR 0482

3

B

135550m Tool steel. Zaichenko, S. S.; Polushkin, N. A.; Kalmykov, Yu. D.; Chichkanov, A. I.; Shevchenko, Y. I.; Biryukova, V. N.; Aref'ev, B. V. U.S.S.R. 260,900 (Cl. C 22c), 06 Jan 1970, Appl. 25 Jul 1968; From *Otkrytiya, Izobret., Prom. Obraztsy, Tovarnye Znaki* 1970, 47(4), 81. Tool steel contg. lower amts. of scarce materials consisted of: C 0.50–0.65, Si 0.60–0.90, Mn 0.20–0.40, Cr 6.5–8.0, Mo 1.1–1.5, W 0.7–1.1, V 0.10–0.25, Ti 0.05–0.15%, Fe and impurities the remainder.
MSCL

REEL/FRAME

19891845

1/2   015   UNCLASSIFIED   PROCESSING DATE--18SEP70
TITLE--SENSITIVITY OF THE NORMAL VIBRATIONS FOR AN ANTIMONY TRIHALIDE TO
  ITS STRUCTURAL PARAMETERS -U-

AUTHOR-(02)-KOZULIN, A.T., BIRYULINA, L.V.

COUNTRY OF INFO--USSR

SOURCE--OPT. SPEKTROSK. 1970, 28(2), 248-50

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--CHEMICAL BONDING, MOLECULAR STRUCTURE, ANTIMONY CHLORIDE,
  BROMIDE, VIBRATION FREQUENCY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1984/0086   STEP NO--UR/0051/70/028/002/0248/0250

CIRC ACCESSION NO--AP0054883
                    UNCLASSIFIED

CIRC ACCESSION NO--AP0054883

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A LINEAR DEPENDENCE OF THE
FREQUENCIES OF NORMAL VIBRATIONS OF SBCL SUB3 AND SBBR SUB3 ON THE
CHANGE OF FORCE COEFFS. WAS FOUND. VALENCY VIBRATIONS SHOW NO
SENSITIVITY TO THE CHANGE OF THE K SUBIJ AND L PRIMENI SUBIJ FORCE
COEFFS., WHEREAS THE DEFORMATION VIBRATIONS ARE NOT SENSITIVE TO THE
CHANGE OF THE K SUBI AND H PRIMEJ SUBI FORCE COEFFS. THE DEPENDENCE OF
NORMAL VIBRATIONS ON THE CHANGE OF BOND ANGLE AND BOND DISTANCE IS
DISCUSSED.

USSR   UDC 546.65'185

BIRYULINA, V. N., and SEREBRENNIKOV, V. V., Tomsk State University

"Rare-Earth Element Phenylhydroxyethylphosphonates"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 9, Sep 73, pp 1865-1868

Abstract: Phenylhydroxyethylphosphonates of the rare earth elements (REE) have the formula $Ln_2[C_6H_5(COH) \cdot (PO_3)CH_3]_3 nH_2O$ where Ln stands for lantanides, excluding promethium. A series of such complexes was obtained by mixing concentrated aqueous solutions of REE salts and α-phenyl-α-hydroxyethyl-phosphonic acid (PHEPA) neutralized with KOH. It was shown that complexes with the formula $[LnC_6H_5C(OH)(PO_3H)CH_3]^{2+}$ where $Ln = La^{3+}$, Sm^{3+}, Gd^{3+}, Dy^{3+}, Ho^{3+}, Lu^{3+} exhibit stability constants of the order of 10^2-10^3 in the series La-Lu.

1/1

Organophosphorous Compounds

USSR   UDC 546.651. 547.58

BIRYULINA, V. N., and SEREBRENNIKOV, V. V., Tomsk State University

"Phosphonates of Rare Earth Elements"

Abstract: The preparation, composition, and some properties are given for the phenyl- (Ph) and α-phenylvinyl(PhV) phosphates of the rare earth elements (REE). The (Ph) have the general formula $Ln_2(C_6H_5PO_3)_3$ and the (PhV) have either the acidic form $Ln[C_6H_5C(PO_3H)CH_2]_3 \cdot nH_2O$ or the neutral $Ln_2[C_6H_5C(PO_3)CH_2]_3 \cdot nH_2O$, Ln being the series of elements Y through Lu. Phenylphosphonic or α-phenylvinylphosphonic acid is used as the starting material. The Ph salts are only slightly soluble in water; the acid PhV are about twice as soluble as the Ph. Both Ph and PhV are soluble in mineral acids; both are also practically nonsoluble in organic solvents. Density, optical rotation, and Ir maxima were determined. Based on the Data given, conclusions were made concerning the bonding in these phosphonates.

1/1

USSR   UDC 616.988.25-07:[616.153.1+616.832.9-008.831]-074

BIRYULYA, Ye. M., Clinic of Acute Neuroinfections, Institute of Poliomyelitis and Virus Encephalitides, Academy of Medical Sciences USSR, Moscow

"Enzymatic Activity of the Blood Serum and Spinal Fluid in Tickborne Encephalitis and Similar Diseases"

Abstract: The enzymatic activity of blood serum and spinal fluid was studied in patients afflicted with tickborne encephalitis and other acute neural infections. The activity of lactic dehydrogenase, aldollase, glutamic-oxalocetic transaminase, and glutimic-pyruvic transaminases in blood serum and spinal fluid was determined. A slight but statistically significant increase in enzymatic activity was observed for patients with tickborne encephalitis, as compared to patients with fever not associated with encephalitis. The enzymatic activity of the spinal fluid depends on the severity of the disease. It is greatest in patients with the focal form of tickborne encephalitis and somewhat less in patients with the meningeal form. As the patient's condition improves, enzymatic activity decreases in both blood serum and spinal fluid and the
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USSR

activity of glutamic-pyruvic transaminase and aldolase are normalized. The data obtained can be used in differential diagnosis, in the solution of therapeutic problems, and in the prognosis of tickborne encephalitis.

2/2

USSR   UDC 616.988.25-022.395.42+616.988.3-07:[616.832.9-008.831+616.153.1]-074

BIRYULYA, Ya. M., Clinic of Acute Neurological Infections, Institute for Polio-myelitis and Virus Encephalitides, Academy of Medical Sciences USSR, Moscow

"Biochemical Shifts in the Organism During Tickborne Encephalitis and Other Acute Neurological Infections"

Abstract: The activity of aldolase, lactic dehydrogenase, and glutamic-oxalacetic and glutamic-pyruvic transaminases was investigated in the cerebrospinal fluid and blood serum of 164 patients with acute tickborne encephalitis, related febrile diseases, and suppurative and serous meningitis. Enzymatic activity was dis-tinctly increased, especially in the cerebrospinal fluid, the extent of increase varying with the severity of the clinical form of the disease, the condition of the patient, and the intensity of the neurological symptoms. In patients with the focal form of tickborne encephalitis, enzymatic activity in the cerebrospinal fluid reached a peak at the time that paresis and paralysis developed. As the condi-tion of patients improved, enzymatic activity decreased in the cerebrospinal fluid. Aldolase and lactic dehydrogenase activity was much higher in suppurative menin-gitis than during tickborne encephalitis or serous meningitis. The difference in levels of enzymatic activity in the cerebrospinal fluid during these neurological diseases suggests that enzymatic tests might be useful for purposes of differential diagnosis.

USSR   UDC 612.17.014.21-06:612.766.2

KOPTEVA, L. A., BIRYUZOVA, V. I., and SHUL'ZHENKO, Ye. B., Institute of Normal
and Pathological Physiology, Academy of Medical Sciences USSR, and Institute of
Molecular Biology, Academy of Sciences USSR, Moscow

"Biochemical and Electron-Microscopic Characteristics of Dog Heart Mitochondria
During Hypokinesia"

Abstract: After dogs had been kept in a state of hypokinesia for 15 days, their
heart weight was reduced by 20-25% and the quantity of heart mitochondria de-
creased. The concentration of high-polymer RNA in the mitochondria decreased by
50.8% in the left ventricle and by 27.5% in the right ventricle. The capacity of
mitochondrial proteins to incorporate C^{14}-labelled amino acids (proline, valine,
arginine, serine, and threonine) decreased by a factor of 4.5 for the left
ventricle and 2.5 for the right ventricle. An electron-microscopic study indi-
cated that there was only slight deterioration of the structure of mitochondria
of the ventricles. Mitochondria of the general type were mainly affected, and
those of the muscle type were well preserved.

1/1

UNCLASSIFIED   PROCESSING DATE--20NOV70
TITLE--MORPHOLOGICAL CHANGES IN CULTURED AMNION EPITHELIAL CELLS IN THE
   PRESENCE OF AMINOACRIDINES -U-
AUTHOR-(03)-STEFANOVA, N.G., BIRYUZOVA, V.I., ZELENIN, A.V.

COUNTRY OF INFO--USSR

SOURCE--DOKL. AKAD. NAUK SSSR 1970, 191(2), 453-6

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--EMBRYOLOGY, MORPHOLOGY, CELL CULTURE, ELECTRON MICROSCOPY,
   CYTOPLASM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3005/1675   STEP NO--UR/0020/70/191/002/0453/0456

CIRC ACCESSION NO--AT0133580
                  UNCLASSIFIED

2/2   018   UNCLASSIFIED   PROCESSING DATE--20NOV70
CIRC ACCESSION NO--AT0133580
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. SINGLE LAYER CULTURES OF STRAIN M
OF CELLS OF HUMAN AMNYOTIC EPITHELIUM WERE INCUBATED WITH VARIOUS
CONCNS. CF ACRIDINE ORANGE AND PROFLAVINE AT VARIOUS TIME INTERVALS,
THEN SUBJECTED TO ELECTRON MICROSCOPIC EXAMN. BOTH NUCLEI AND CYTOPLASM
WERE ALTERED BY TREATMENT WITH THESE DYES AND PHOTOMICROGRAPHS OF
TYPICAL STRUCTURES WERE SHOWN. AT HIGHER CONCN. OF THESE DYES THERE IS
AN ACCUMULATION OF BASOPHILIC MATTER IN THE CYTOPLASM.   FACILITY:
INST. MOL. BIOL., MOSCOW, USSR.

UNCLASSIFIED

USSR   UDC 621.039.531:669.27

BYKOV, V. N., BIRZHEVOY, G. A., ZAKHAROVA, M. I., and SOLOV'YEV, V. A.

"The Nature and Thermal Stability of Radiation-Induced Defects in Single-Crystal Tungsten"

Abstract: The analysis of radiation-induced defects in tungsten shows that the interpretation of the types of defects characteristic for different annealing stages in tungsten is not well-defined. Investigation results are presented on the nature of radiation defects and their stability at temperatures to 2200°C in single-crystal tungsten irradiated at 450-500°C with a dose of $1.4 \cdot 10^{22}$ neutrons/cm^2. This irradiation brings about an increase in electric resistance by 18% at 298°K, by 140% at 77°K, and nearly by 1000 times at 4.2°K; it also results in an accumulation of rhenium in the amount of 0.2 at%. The characteristics of three identified annealing stages of radiation defects and their activation energies are given. The change of the specific electric resistance of single-crystal tungsten during irradiation is associated with the development of small accumulations by hydrogen atoms (20.2%), single vacancies and small accumulations of vacancies (16.5%), complex defects (43.3%), and also with
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USSR

BYKOV, V. N., et al., Atomnaya Energiya, Vol 33, No 4, Oct 72, pp 809-813

the formation of rhenium (20%). The high integral flow of neutrons, the high irradiation temperature $[(0.20-0.21)T_{fusion}]$, and the absence of grain boundaries for the discharging of defects lead to an accumulation of basically complex defects, stable up to 1900°C and giving rise to the change of electric resistance. Four figures, three tables, twenty-two bibliographic references.

2/2

- 29 -

USSR

UDC 621.31-.32

BIRENZYER, L.V., VOROB'YEV, I.A.

"Thyristorized Pulse D-C Converter With Continuous Output Voltage"

V sb. Poluprovodniki i ikh primeneniye v elektrotekhn. (Semiconductors And Their Application In Electrical Engineering--Collection Of Works), No 4, Riga, "Zinatne," 1970, pp 219-232 (from RZh--Elektronika i yeye primeneniye, No 10, October 1970, Abstract No 10B544)

Translation: The thyristorized pulse converter with continuous output voltage considered is intended for the power supply of a traction motor with series excitation. A L-shaped filter is provided at the input. The series-connected capacitor and motor and also a counter--series connected thyristor and semiconductor diode are connected in parallel with the input capacitor. A common point of the motor and capacitor, and a thyristor cathode are connected via a smoothing choke. For computation an equivalent circuit is composed in which the input filter and motor are replaced by a counter EMF. A method is presented for an approximate determination of the smoothing inductance and capacitance (on the assumption of ideal smoothing of the current in the motor). In conformity with this method, computed dependences are given for determination of the pulsations of voltage and current in the elements of the circuit. 4 ill. 3 tab. 1 ref. I.R.

1/1

BIRZVALK, Yu. A.

CURRENT COEFFICIENTS OF A CONDUCTION MAGNETOHYDRODYNAMIC CONVERTER CONSIDERING THE M-SHAPE OF THE VELOCITY PROFILE

[Abstract of a Paper by Yu. A. Birzvalk, U. Ye. Peterson Given at the Magneto-hydrodynamic Conference, pp 134-135]

The M-shape of the velocity profile predicted by Shercliff [1] was investigated in reference [2] for the case of nonconducting channel walls. In the paper, the same problem was solved for the condition of $\varphi = \text{const}$ on electrodes (Figure 1), which corresponds to the magnetohydrodynamic channel operating in the pump mode (for $U_k > E = vBb$) or a generator (for $U_k < E$). The solution of the problem turned out to be qualitatively similar to the result of reference [2]: in the liquid, vorticity occurs and the M-configuration of the velocity profile connected with this (Figure 1). The vorticity factor $k_H = v_{min}/v_{max}$ is smaller, the larger $k_U = U_k/E$, that is, in the pump mode M-configuration of the profile is expressed more sharply than in the generator mode. Accordingly, the coefficients Γ_{ik} (i, $k = 1$, 2) also depend on k_U (Figure 2; here $\Gamma_k = 1/b - 2$), and the primary equations of the magnetohydrodynamic channel [3] acquire the form (I — the channel feed current, I_q — the operating current):

$$ I/ex = \Gamma_{11}U_k - \Gamma_{12}E = (\Gamma_{11} - \Gamma_{12})U_k - \Gamma_{12}E. $$

$$ I_q/ex = \Gamma_{21}U_k - \Gamma_{22}E = (\Gamma_{21} - \Gamma_{22})U_k - \Gamma_{22}E. $$

Here $\Gamma_{11} = \Gamma_{11}/\Gamma_1\Gamma_{12}$, $\Gamma_{21} = \Gamma_{21}/\Gamma_1\Gamma_{22}$ (Figure 2). Consequently, for the linear dependence of Γ_{12} and Γ_{22} on k_U the equations of the magnetohydrodynamic converter remain linear (1), but in then the principle of duality does not remain in effect ([3], equation (8), pakos 418-419): $\Gamma_{12} \ne \Gamma_{21} - \Gamma_{22}$. This leads to the fact that, in particular, the maximum efficiency in the pump and generator modes turn out to be different.   (1)

In Figure 2 for comparison we also have the calculated values of $\Gamma_{11} = 2.461$ (indicated by the circle) and $\Gamma_{12} = \Gamma_{21} = \Gamma_{11} - k_{ub}$, $\Gamma_{22} = \Gamma_{21} + k_q$ borrowed

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Handwritten:

BIRZVALK, Yu. A.

EXPERIMENTAL STUDY OF AN AC CONDUCTION PUMP USING A LIQUID-METAL SODIUM LOOP

An experimental study was made of a laboratory model of a single-phase ac conduction pump with the following parameters:

Rated head $p_n = 0.4 \cdot 10^5$ n/m²,

Rated output capacity $Q_n = 3 \cdot 10^{-3}$ m³/sec,

Metal -- liquid sodium for T°   = 400°C

Dimensions of the channel core $10 \times 50 \times 60$ mm³.

The experiment was performed on a liquid-metal Du-40 circuit of the Physics Institute of the Latvian SSR Academy of Sciences.

The external characteristics $p = p(Q)$, the volt-ampere characteristics u = U(I) under the conditions of p/Q^2 = const and the characteristics n = n(Q) were determined. A study was also made of the distribution of the electric and magnetic fields.

The basic experimental results are depicted in Figures 1 and 2.

Figure 1.

Key: 1. n, n²
      2. m³/sec

Figure 2.

Key: 1. m³/sec

10,845
CSO: 8044/0653-N

USSR   UDC   621.317.715

PREOBRAZHENSKIY,A. A., BISHARD, YE. G., POLONSKIY, A. M., Leningrad Electro-
technical Institute imeni V. I. Ul'yanov

"Digital Ballistic Galvanometer"

Abstract: An integrator with code conversion of the magnitude of the magnetic
flux to pulse number code is investigated. The device is based on a ballistic
galvanometer with a photomask at the input of a special amplifier. It permits
complete automation of the process of measuring magnetic induction with the re-
sults obtained in digital form: the ballistic kick of the galvanometer is con-
verted to a proportional number of pulses by means of the three dimensional
coding converter (photomask) on the instrument scale. Recommendations are
made with respect to selecting the light sensitive transducer and the pulse
amplifier, and experimentally calculated characteristics of the integrating
device are presented.

        The proposed device permits measurement of the magnetic induction with
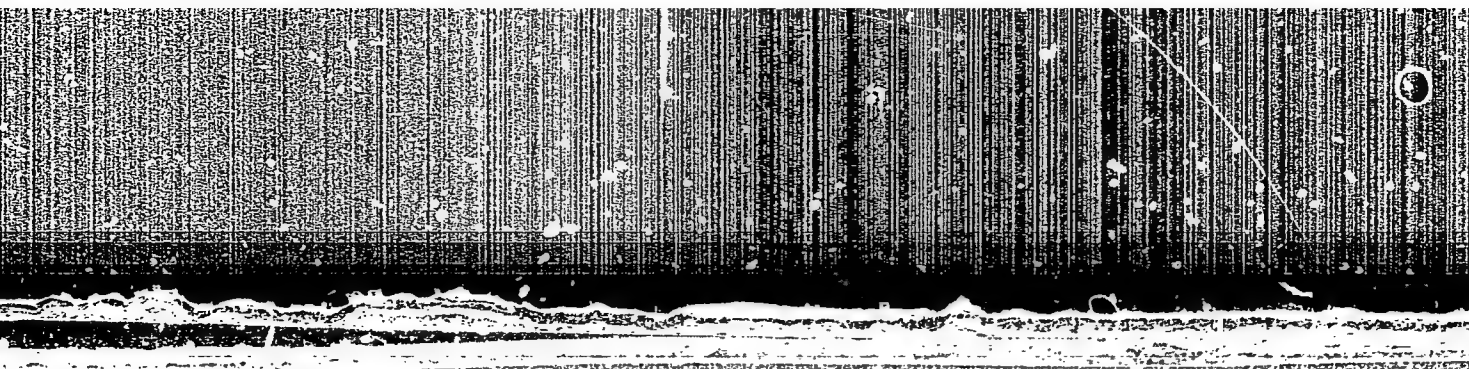an error not exceeding the error from direct measurments by a ballistic
1/2

USSR

PREOBRAZHENSKIY, A. A., et al., Izvestiya Vysshikh Uchebnykh Zavedeniy ---
Priborostroyeniye, Vol XIV, No 3, 1971, pp 17-20

galvanometer. With automatic limit selection of 40 seconds the measurement
time of the device is 10 seconds.

Abstract: The analysis of radiation-induced defects in tungsten shows that the interpretation of the types of defects characteristic for different annealing stages in tungsten is not well-defined. Investigation results are presented on the nature of radiation defects and their stability at temperatures to 2200°C in single-crystal tungsten irradiated at 450-500°C with a dose of $1.4 \cdot 10^{22}$ neutrons/cm^2. This irradiation brings about an increase in electric resistance by 18% at 298°K, by 140% at 77°K, and nearly by 1000 times at 4.2°K; it also results in an accumulation of rhenium in the amount of 0.2 at%. The characteristics of three identified annealing stages of radiation defects and their activation energies are given. The change of the specific electric resistance of single-crystal tungsten during irradiation is associated with the development of small accumulations by hydrogen atoms (20.2%), single vacancies and small ac-cumulations of vacancies (16.5%), complex defects (43.3%), and also with

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USSR

BYKOV, V. N., et al., Atomnaya Energiya, Vol 33, No 4, Oct 72, pp 809-813

the formation of rhenium (20%). The high integral flow of neutrons, the high irradiation temperature $[(0.20-0.21)T_{fusion}]$, and the absence of grain boundaries for the discharging of defects lead to an accumulation of basically complex defects, stable up to 1900°C and giving rise to the change of electric resistance. Four figures, three tables, twenty-two bibliographic references.

2/2

UDC 621.314.58

USSR

BIRZNIYEK, L.Y., VOROB'YEV, I.A.

"Thyristorized Pulse D-C Converter With Continuous Output Voltage"

V sb. Poluprovodniki i ikh primeneniye v elektrotekhn. (Semiconductors And Their Application In Electrical Engineering--Collection Of Works), No 4, Riga, "Zinatne," 1970, pp 219-232 (from RZh--Elektronika i yeye primeneniya, No 10, October 1970, Abstract No 10B344)

Translation: The thyristorized pulse converter with continuous output voltage considered is intended for the power supply of a traction motor with series excitation. A L-shaped filter is provided at the input. The series-connected capacitor and motor and also a counter--series connected thyristor and semiconductor diode are connected in parallel with the input capacitor. A common point of the motor and capacitor, and a thyristor cathode are connected via a smoothing choke. For computation an equivalent circuit is composed in which the input filter and motor are replaced by a counter EMF. A method is presented for an approximate determination of the smoothing inductance and capacitance (on the assumption of ideal smoothing of the current in the motor). In conformity with this method, computed dependences are given for determination of the pulsations of voltage and current in the elements of the circuit. 4 ill. 3 tab. 1 ref. I.R.
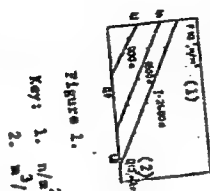
1/1

BIRZVALK, Yu. A.

JPRS 60634
27 November 1973

CURRENT COEFFICIENTS OF A CONDUCTION MAGNETOHYDRODYNAMIC CONVERTER CONSIDERING
THE M-SHAPE OF THE VELOCITY PROFILE

[Abstract of a Paper by Yu. A. Birzvalk, D. Yu. Peterson Given at the Magneto-
hydrodynamic Conference, pp 134-136]

The M-shape of the velocity profile predicted by Shercliff [1] was investi-
gated in reference [2] for the case of nonconducting channel walls. In the
paper, the same problem was solved for the condition of ϕ = const on electrodes
(Figure 1), which corresponds to the magnetohydrodynamic channel operating in
the pump mode (for $U_k > vM$) or a generator (for $U_k < E$). The solution of
the problem turned out to be qualitatively similar to the result of reference
[2]; in the liquid, vorticity occurs and the M-configuration of the velocity
profile connected with this (Figure 1). The vorticity factor $k_j - v_{min}/v_{max}$
is smaller, the larger $k_0 - U_k/E$, that is, in the pump mode M-configuration of
the profile is expressed more sharply than in the generator mode. According to
the coefficients Γ_{ik} (i, k = 1, 2) also depend on k_0 (Figure 2; here $k_0 = 1/3 - 2$),
and the primary equations of the magnetohydrodynamic channel [3] acquire the
form (I — the channel feed current, I_2 — the operating current):

$$U/ra = \Gamma_{11} U_k - \Gamma_{12} E - (\Gamma_{11} - \Gamma_{12}) U_k - \Gamma_{12} vM E.$$

$$I_2/ra = \Gamma_{21} U_k - \Gamma_{22} E - (\Gamma_{21} - \Gamma_{22}) U_k - \Gamma_{22} vM E.$$ (1)

Here $\Gamma_{11} = \Gamma_{11}/k_j$, $\Gamma_{12} = \Gamma_{12}/k_j$, $\Gamma_{21} = \Gamma_{21}/k_j k_0$, the coefficients of the magnetohydrodynamic con-
dependence of Γ_{12} and Γ_{22} on k_0 (Figure 2). verter remain linear (1), but in them the principle of duality does not remain
in effect [3]; equation (8); [4], pages 418-419): $\Gamma_{20} \neq \Gamma_{21} - \Gamma_{22}$. This leads
to the fact that, in particular, the maximum efficiency in the pump and generator
modes turn out to be different.

In Figure 2 for comparison we also have the calculated values of $\Gamma_{11} = 2.4$
(indicated by the circle) and $\Gamma_{12} = \Gamma_{21} = \Gamma_{11} = x_0$, $\Gamma_{12} = \Gamma_{21} + x_0$ borrowed)

- 52 -

BIRZVALK, Yu. A.

10,845
0501 8064/0653-M

EXPERIMENTAL STUDY OF AN AC CONDUCTION PUMP USING A LIQUID-METAL SODIUM LOOP

[Abstract of a Paper by Yu. A. Birzvalk, Ya. Y. Brivkalns, M. M. Nadezhnikov, Given at the Magnetohydrodynamic Conference, P 143]

An experimental study was made of a laboratory model of a single-phase ac conduction pump with the following parameters:

Rated head $P_n = 0.4 \cdot 10^5$ n/m².
Rated output capacity $Q_n = 3 \cdot 10^{-3}$ m³/sec.
Metal — liquid sodium for T^0 ... $\theta_n = 400°C$
Dimensions of the channel core ... $10 \times 50 \times 60$ mm³.

The experiment was performed on a liquid-metal Na-AO circuit of the Physics Institute of the Latvian SSR Academy of Sciences.

The external characteristics $P = P(Q)$, the volt-ampere characteristics $U = U(I)$ under the condition of $P/Q^2 = $ const and the characteristics $\eta = \eta(Q)$ were determined. A study was also made of the distribution of the electric and magnetic fields.

The basic experimental results are depicted in Figures 1 and 2.

Figure 1.
Key: 1. n/m²
2. m³/sec

Figure 2.
Key: 1. m³/sec

UDC 621.317.715

USSR

PREOBRAZHENSKIY, A. A., BISHARD, YE. G., POLONSKIY, A. M., Leningrad Electro-
technical Institute imeni V. I. Ul'yanov

"Digital Ballistic Galvanometer"

Leningrad, Izvestiya Vysshikh Uchebnykh Zavedeniy -- Priborostroyeniye, Vol
XIV, No 3, 1971, pp 17-20

Abstract: An integrator with code conversion of the magnitude of the magnetic
flux to pulse number code is investigated. The device is based on a ballistic
galvanometer with a photomask at the input of a special amplifier. It permits
complete automation of the process of measuring magnetic induction with the re-
sults obtained in digital form: the ballistic kick of the galvanometer is con-
verted to a proportional number of pulses by means of the three dimensional
coding converter (photomask) on the instrument scale. Recommendations are
made with respect to selecting the light sensitive transducer and the pulse
amplifier, and experimentally calculated characteristics of the integrating
device are presented.

The proposed device permits measurement of the magnetic induction with
an error not exceeding the error from direct measurments by a ballistic

1/2

USSR

PREOBRAZHENSKIY, A. A., et al., Izvestiya Vysshikh Uchebnykh Zavedeniy --
Priborostroyeniye, Vol XIV, No 3, 1971, pp 17-20

galvanometer. With automatic limit selection of 40 seconds the measurement
time of the device is 10 seconds.

2/2

1/2   025
TITLE--PLANE, CYLINDRICAL, AND SPHERICAL EXPLOSIONS IN A DETONATING GAS
WITH A COUNTERPRESSURE -U-

AUTHOR--BISHIMOV, YE.

COUNTRY OF INFO--USSR

SOURCE--AKADEMIIA NAUK KAZAKHSKOI SSR, IZVESTIIA, SERIIA FIZIKO
MATEMATICHESKAIA, VOL. 8, JAN.-FEB. 1970, P. 43-48

DATE PUBLISHED-------70

SUBJECT AREAS--ORDNANCE, PROPULSION AND FUELS

TOPIC TAGS--GAS, DETONATION, EXPLOSION, MATHEMATIC FOUNDATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1996/1523   STEP NO--UR/0361/70/008/000/0043/0048

CIRC ACCESSION NO--AP0118510

UNCLASSIFIED

2/2   025
CIRC ACCESSION NO--AP0118510
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CONSIDERATION OF THE PROBLEM OF
THE PROPAGATION OF PLANE, CYLINDRICAL, AND SPHERICAL EXPLOSION WAVES IN
A FUEL MIXTURE, TAKING COUNTERPRESSURE INTO ACCOUNT. IT IS ASSUMED THAT
THE EXPLOSION OCCURRED AS A RESULT OF INSTANTANEOUS GENERATION OF ENERGY
IN THE GAS ALONG A PLANE, A STRAIGHT LINE, OR AT A POINT. A NUMERICAL
METHOD OF INTEGRAL RELATIONS IS USED TO CALCULATE THE PARAMETERS OF THE
PERTURBED FLOW. THE INITIAL DATA ARE TAKEN FROM A LINEARIZED SOLUTION
TO THE PROBLEM OF AN EXPLOSION IN A DETONATING GAS. THE RESULTS OF
CALCULATIONS FOR VARIOUS VALUES OF THE POISSON ADIABATIC INDEX ARE
PRESENTED FOR THE CASE WHERE THE HEAT GENERATION IS CONSTANT IN THE
DETONATION WAVE AND FOR THE CASE WHERE IT DEPENDS ON THE COORDINATE OF
THE WAVEFRONT, USING A METHOD WHERE THE UNKNOWN FUNCTIONS ARE
APPROXIMATED BY FOURTH DEGREE POLYNOMIALS.

1/2   009   UNCLASSIFIED   PROCESSING DATE--16OCT70
TITLE--STRATIGRAPHICAL AND GEOMORPHOLOGICAL INVESTIGATIONS FOR
NEOTECTONICAL MAPPING, EXAMPLIFIED BY THE USSR NORTH EAST -U-
AUTHOR-(02)-BARANOVA, YU.P., BISKE, S.F.

COUNTRY OF INFO--USSR

SOURCE--GEOLOGIYA I GEOFIZIKA, 1970, NR 3, PP 3-11

DATE PUBLISHED-------70

SUBJECT AREAS--EARTH SCIENCES AND OCEANOGRAPHY

TOPIC TAGS--STRATIGRAPHY, GEOMORPHOLOGY, GEOLOGIC MAPPING, TECTONICS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1991/0747   STEP NO--UR/0210/70/000/003/0003/0011

CIRC ACCESSION NO--AP0110471
                         UNCLASSIFIED

CIRC ACCESSION NO--AP0110471

ABSTRACT/EXTRACT--(U) GP-0-   ABSTRACT.   THE NECESSARY CONDITIONS FOR
ANALYTICAL SYNTHETIC AND COMPLICATED NEOTECTONICAL MAPPING ARE
CONSIDERED IN THE PAPER.   THE RECENT IDEAS OF SOME INVESTIGATORS ON
NORTH EAST NEOTECTONICS AND THEIR COMPARISON WITH NEW DATA ON
STRATIGRAPHY ARE ANALYZED.   NEW SCHEME OF THE TERRITORY CONTINENTAL
DEVELOPMENT STAGES FOR DIFFERENT GEOSTRUCTURAL AREAS IN MESOZOIC AND
CENOZOIC IS PROPOSED BASED UPON RECENT DATA ON STRATIGRAPHY AND HISTORY
OF RELIEF DEVELOPMENT.   FACILITY: IGIG SO AN SSSR, NOVOSIBIRSK.

UNCLASSIFIED

Nuclear Physics

USSR

BISNOVATYY-KOGAN, G. S., ZEl'DOVICH, Ya. B. and SYNYAYEV, R. A.

"Equilibrium Concentration of Positrons in Optically Thin Relativistic Plasma"

Abstract: Physical processes are described for a low-density plasma in which radiation is emitted freely. The positron concentration is determined by the equilibrium processes of pair formation, by collisions of e^- and e^+ with nuclei and each other (without photon emission), and annihilation of electrons and positrons (with photon emission). The principal result is that there is no equilibrium states at temperatures above 20 mev, which is the upper temperature limit of an optically thin relativistic plasma. Relations are given for the second-order annihilation process, the number of annihilations per unit volume per unit time for a Maxwellian distribution of electrons and positrons, and pair formation by charged-particle collisions.
 Comparisons are made with processes in astrophysical radio sources in which there are no stationary states, little equilibrium, large temperature variations, and the positron concentration depends on the pumping energy. From energy considerations, pair generation is always much less than synchrotron radiation. In

the presence of a magnetic field positrons remain localized, while photons leave
an optically thin region, when r < 1. A relativistic plasma of identical par-
ticles can exist for extended periods, and energy losses are compensated by radia-
tion, shock waves and varying magnetic fields, as in the radio source regions of
pulsars and quasars. Calculations made apply to plasmas having lifetimes longer
than the time required for equilibrium to become established.   Orig. art. has

The authors thank A. Z. Dolginov for stimulating discussions.

3 refs.

TITLE--RELATIVISTIC GAS SPHERES AND CLUSTERS OF POINT MASSES WITH
ARBITRARILY LARGE CENTRAL REDSHIFTS: CAN THEY BE STABLE -U-

AUTHOR-(02)-BISNOVATYIKOGAN, G.S., THORNE, K.S.

COUNTRY OF INFO--USSR

SOURCE--ASTROPHYS. J. (USA), VOL. 160, NO. 3, PT. 1, P. 875-86 (JUNE 1970)

DATE PUBLISHED----JUN70

SUBJECT AREAS--ASTRONOMY, ASTROPHYSICS

TOPIC TAGS--RELATIVISTIC QUANTUM MECHANICS, STAR CLUSTER, PERTURBATION,
PLASMA STABILITY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY FICHE NO----FD70/605004/E06 STEP NO--US/0000/70/160/003/0875/0886

CIRC ACCESSION NO--AP0139664

CIRC ACCESSION NO--AP0139664

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. RECENTLY BISNOVATYI-KOGAN AND
ZEL'DOVICH HAVE CONSTRUCTED GENERAL RELATIVISTIC MODELS OF GAS SPHERES
AND OF COLLISIONLESS STAR CLUSTERS, FOR WHICH THE REDSHIFT FROM THE
CENTER TO INFINITY IS ARBITRATILY LARGE; AND THEY HAVE SPECULATED THAT
THE PARTICULAR MODELS MIGHT BE STABLE AGAINST SMALL PERTURBATIONS.   IN
THIS PAPER IT IS PROVED THAT THE GAS SPHERES ARE, INDEED, STABLE AT
LEAST AGAINST RADIAL PERTURBATIONS.   AS FOR THE CLUSTERS, THE MOST
POWERFUL TECHNIQUES YET DEVISED YIELD INCONCLUSIVE RESULTS FOR
STABILITY.   HOWEVER, FROM THE BEHAVIOR OF THE CLUSTERS UNDER SCRUTINY BY
THOSE TECHNIQUES, THE AUTHORS BELIEVE THAT PROBABLY THEY ARE STABLE.
FACILITY: ACAD. SCI., MOSCOW, USSR.

UNCLASSIFIED

UDC 51:621.391

USSR

BISTRITSKAS, V.

"A Continuous Analog of the Trichotomic Process of Dynamic Programming"

Lit. mat. sb. (Lithuanian Mathematical collection), Vol 13, No 3, 1973, pp 63-72 (abstract in Lithuanian and English) (from RZh Matematika, No 11, Nov 73, abstract No 11 V683)

Translation: A continuous analog of the trichotomic process of dynamic programming

$$f(x,y) = \max \begin{bmatrix} A: & p_1[r_1 x + f(1-r_1)xmy)], \\ B: & p_2[r_2 y + f(x,(1-r_2)y)], \\ C: & p_3[r_3 x + r_4 y + f((1-r_3)x,(1-r_4)y)] \end{bmatrix},$$

$$0 \le p_i, \ r_j \lhd,$$

1/2

is constructed. In the continuous case, a problem of optimal control is obtained. It is shown that the continuous process of optimal control has not more than four areas of control (solutions) and that there exist values of the parameters for which this process has four regions of control. The regions of control are found in explicit form.
Abstract by the author.

2/2

USSR

BISTRITSKAS, V.

"On the Problem of Convergence of the Discrete Process of Optimum Control to the Continuous Process"

Translation: It is proved that the control regions of a discrete optimum control process

$$l(x, y) = \max \begin{bmatrix} A: p_1^\Delta \left[ax\,\Delta + by\,\Delta + l\,(r_1^\Delta\,x,\ r_2^\Delta\,y)\right]. \\ B: p_2^\Delta \left[cx\,\Delta + dy\,\Delta + l\,(s_1^\Delta\,x,\ s_2^\Delta\,y)\right]. \end{bmatrix}$$

where $0 < p_i\,r_i,\ p_2\,s_i < 1;\ i=1,2;\ p_i\,\Delta > 0;\ x,\ y > 0$ converge to the control regions of its continuous analog as $\Delta \to 0$. Author's abstract.

- 42 -

1/1

UDC 512.25/.26+519.3:330.115

USSR

BISTRITSKAS, V.

"Optimal Control of Continuous Process of Dynamic Programming in Infinite Time Interval"

Lit. Mat. Sb. [Lithuanian Mathematics Collection], Vol 10, No 4, 1970, pp 681-692, (Translated from Referativnyy Zhurnal, Kibernetika, No 6, 1971, Abstract No 6 V537 by the author).

Translation: A continuous version of the more general "goldmining" equation

$$f(x, y) = \max \begin{bmatrix} A: ax + by + p_1 f(r_1 x, r_2 y), \\ B: cx + dy + p_2 f(s_1 x, s_1 y) \end{bmatrix},$$

is studied when the parameters $|a|$, $|b|$, $|c|$, $|d|$; x, y, $P_i < \infty$, $i = 1, 2$, satisfy the inequality $0 \le p_1 r_i$, $p_2 s_i < 1$; x, y, $P_i \ge 0$. A problem in optimal control is produced. Among all permissible controls $\phi_1(t)$, $0 \le \phi_1(t) \le 1$, find the control for which the integral

$$\int_0^\infty x_1 [(ax_1 + bx_2) q_1(t) + (cx_1 + dx_2) q_2(t)] dt$$

takes on its least possible value, when the phase trajectory $x(t) = (x_1(t),$

$(x_2, x_2(t))$ satisfies the system of differential equations

$$\frac{dx_1}{dt} = [\varphi_1(t) \ln r_1 + \varphi_2(t) \ln s_1] x_1(t), \quad x_1(0) = x;$$

$$\frac{dx_2}{dt} = [\varphi_1(t) \ln r_2 + \varphi_2(t) \ln s_2] x_2(t), \quad x_2(0) = y;$$

$$\frac{dx_3}{dt} = [\varphi_1(t) \ln p_1 + \varphi_2(t) \ln p_2] x_3(t), \quad x_3(0) = l,$$

where $\phi_2(t) = 1 - \phi_1(t)$. A synthesis of the optimal control is found.

UDC 512.25/.26+519.3:330.115

USSR

BISTRITSKAS, V.

"Infinite-Step Dichotomic Process for Solution of Dynamic Programming"

Lit. Mat. Sb., [Lithuanian Mathematics Collection], Vol 10, No 5, 1970, pp 445-452, (Translated from Referativnyy Zhurnal Kibernetika, No 5, 1971, Abstract No. 5V556 by the author).

Translation: A theorem of the existence and uniqueness of a solution is proven for the most general "gold mining" equation:

$$f(x, y) = \max \begin{bmatrix} A: ax + by + p_1 f(r_1 x, & r_2 y) \\ B: cx + dy + p_2 f(t_1 x, & t_2 y) \end{bmatrix},$$

where the parameters a, b, c, d, r_i, t_i, $i = 1, 2$, satisfy the inequalities $0 \leq p_1 r_i$: $p_2 t_i < 1$, $0 \leq |a|$, $|b|$, $|c|$, $|d|$, x, y, $p_i < \infty$. The solution of this equation in the space of policies is found.

1/1

- 37 -

TITLE--RELATIVISTIC GAS SPHERES AND CLUSTERS OF POINT MASSES WITH
  ARBITRARILY LARGE CENTRAL REDSHIFTS: CAN THEY BE STABLE -U-
AUTHOR-(02)-BISNOVATYIKOGAN, G.S., THORNE, K.S.

COUNTRY OF INFO--USSR

SOURCE--ASTROPHYS. J. (USA), VOL. 160, NO. 3, PT. 1, P. 875-86 (JUNE 1970)

DATE PUBLISHED-----JUN70

SUBJECT AREAS--ASTRONOMY, ASTROPHYSICS

TOPIC TAGS--RELATIVISTIC QUANTUM MECHANICS, STAR CLUSTER, PERTURBATION,
  PLASMA STABILITY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY FICHE NO-----FD70/605004/E06 STEP NO--US/0090/70/160/003/0875/0886

CIRC ACCESSION NO--AP0139664

CIRC ACCESSION NO--AP0139664

ABSTRACT/EXTRACT--(U) GP-0-   ABSTRACT.   RECENTLY BISNOVATYI-KOGAN AND ZEL'DOVICH HAVE CONSTRUCTED GENERAL RELATIVISTIC MODELS OF GAS SPHERES AND OF COLLISIONLESS STAR CLUSTERS, FOR WHICH THE REDSHIFT FROM THE CENTER TO INFINITY IS ARBITRATILY LARGE; AND THEY HAVE SPECULATED THAT THE PARTICULAR MODELS MIGHT BE STABLE AGAINST SMALL PERTURBATIONS.   IN THIS PAPER IT IS PROVED THAT THE GAS SPHERES ARE, INDEED, STABLE AT LEAST AGAINST RADIAL PERTURBATIONS.   AS FOR THE CLUSTERS, THE MOST POWERFUL TECHNIQUES YET DEVISED YIELD INCONCLUSIVE RESULTS FOR STABILITY.   HOWEVER, FROM THE BEHAVIOR OF THE CLUSTERS UNDER SCRUTINY BY THOSE TECHNIQUES, THE AUTHORS BELIEVE THAT PROBABLY THEY ARE STABLE.
     FACILITY: ACAD. SCI., MOSCOW, USSR.

UNCLASSIFIED

BISTRITSKAS, V.

"A Continuous Analog of the Trichotomic Process of Dynamic Programming"

Translation: A continuous analog of the trichotomic process of dynamic programming

$$f(x,y) = \max \begin{bmatrix} A: & p_1\left[r_1 x + f\left((1-r_1)xmy\right)\right], \\ B: & p_2\left[r_2 y + f\left(x,(1-r_2)y\right)\right], \\ C: & p_3\left[r_3 x + r_4 y + f\left((1-r_3)x,(1-r_4)y\right)\right] \end{bmatrix},$$

$$0 \leq p_1, \; r_j \lessdot 1,$$

1/2

USSR

is constructed. In the continuous case, a problem of optimal control is
obtained. It is shown that the continuous process of optimal control has not
more than four areas of control (solutions) and that there exist values of
the parameters for which this process has four regions of control. The regions
of control are found in explicit form.
Abstract by the author.

2/2

BISTRITSKAS, V.

"On the Problem of Convergence of the Discrete Process of Optimum Control to the Continuous Process"

Translation: It is proved that the control regions of a discrete optimum control process

$$l(x, y) = \max \begin{bmatrix} A : p_1^\Delta \ [ax\,\Delta + by\,\Delta + l\,(r_1^\Delta\,x,\ r_2^\Delta\,y)]. \\ B : p_2^\Delta \ [cx\,\Delta + dy\,\Delta + l\,(s_1^\Delta\,x,\ s_2^\Delta\,y)]. \end{bmatrix}$$

where $0 < p_i, r_i, p_i, s_i < 1;\ i = 1, 2;\ p_i\,\Delta > 0;\ x, y > 0$ converge to the control regions of its continuous analog as $\Delta \to 0$. Author's abstract.

- 42 -

1/1

USSR   UDC 512.25/.26+519.3:330.115

BISTRITSKAS, V.

"Optimal Control of Continuous Process of Dynamic Programming in Infinite Time Interval"

Lit. Mat. Sb. [Lithuanian Mathematics Collection], Vol 10, No 4, 1970, pp 681-692, (Translated from Referativnyy Zhurnal, Kibernetika, No 6, 1971, Abstract No 6 V537 by the author).

Translation: A continuous version of the more general "goldmining" equation

$$f(x, y) = \max \begin{bmatrix} A: ox + by + p_1 f(r_1 x, r_2 y), \\ B: cx \div dy \div p_2 f(s_1 x, s_2 y) \end{bmatrix},$$

is studied when the parameters $|a|$, $|b|$, $|c|$, $|d|$; x, y, $p_i < \infty$, i = 1, 2, satisfy the inequality $0 \leq p_1 r_i$, $p_2 s_i < 1$; x, y, $p_i \geq 0$. A problem in optimal control is produced. Among all permissible controls $\phi_1(t)$, $0 \leq \phi_1(t) \leq 1$, find the control for which the integral

$$\int_0^{\infty} x_1 [(ax_1 \div bx_2) q_1(t) \div (cx_1 \div dx_2) q_2(t)] dt$$

takes on its least possible value, when the phase trajectory $x(t) = (x_1(t), x_2(t), x_3(t))$ satisfies the system of differential equations

$$\frac{dx_1}{dt} = [\varphi_1(t) \ln r_1 + \varphi_2(t) \ln s_1] x_1(t), \quad x_1(0) = x;$$

$$\frac{dx_2}{dt} = [\varphi_1(t) \ln r_2 + \varphi_2(t) \ln s_2] x_2(t), \quad x_2(0) = y;$$

$$\frac{dx_3}{dt} = [\varphi_1(t) \ln p_1 + \varphi_2(t) \ln p_2] x_3(t), \quad x_3(0) = t,$$

where $\phi_2(t) = 1 - \phi_1(t)$. A synthesis of the optimal control is found.

2/2

BISTRITSKAS, V.

"Infinite-Step Dichotomic Process for Solution of Dynamic Programming"

Translation: A theorem of the existence and uniqueness of a solution is proven
for the most general "gold mining" equation:

$$f(x, y) = \max \begin{bmatrix} A: ax + by + p_1 f(r_1 x, \ r_2 y) \\ B: cx + dy + p_2 f(t_1 x, \ t_2 y) \end{bmatrix},$$

where the parameters a, b, c, d, r_i, t_i, i = 1, 2, satisfy the inequalities
$0 \leq p_1 r_i, \ p_2 t_i < 1$, $0 \leq |a|$, $|b|$, $|c|$, $|d|$, x, y, $p_i < \infty$. The solution of
this equation in the space of policies is found.

1/1

USSR   UDC   621.371.3.029.7

BISYARIN, V. P., BISYARINA, I. P., SOKOLOV, A. V.

"On the Problem of Attenuation of Laser Emission on a Wavelength of 10.6μ
in Artificial and Natural Mists"

Moscow, Radiotekhnika i Elektronika, Vol 16, No 10, Oct 71, pp 1758-1764

Abstract: The paper gives the results of measurements of the coefficients
of attenuation of laser emission on a wavelength of 10.6 μ in artificial
and natural mists on transmission paths of 15 m and 1.36 km respectively.
Experimental relations are presented for attenuation on 10.6 μ as a func-
tion of the attenuation on 0.63 μ and the meteorological visibility. It
is shown that attenuation on a wavelength of 10.6 μ is in many instances
less than the attenuation on 0.63 μ, and depends appreciably on the micro-
structure of the mist, which is in accord with the theoretical calculations.
Estimates of mist characteristics are given for both cases, which show that
the man-made mists are close to natural fog. Seven figures, one table,
bibliography of ten titles.

1/1

USSR

UDC   621.373.826:550

BISYARIN, V. P., BISYARINA, I. P., and SOKOLOV, A. V.

"Recurrence of Attenuation Factors at Wavelengths of 0.63 and 10.6 Microns in the Atmosphere"

Moscow, V sb. X Vses. konf. po rasprostr. radiovoln. Tezisy dokl. (Tenth All-Union Conference on the Propagation of Radio Waves; Report Theses--collection of works) "Nauka," 1972, pp 174-178 (from RZh--Radiotekhnika, No 10, 1972, Abstract No 10D378)

Translation: Estimation of the recurrence of attenuation factors for radiation in the atmosphere is of great interest from the viewpoint of determinations of the efficiency of optical lines of communication. Results are given of measurements of radiation at wavelengths of 0.63 and 10.6 microns which show that hydrometeorology makes the principal contribution to radiation attenuation. Weakening of the 10.6 micron radiation, caused by molecular absorption, is comparable to fog attenuation. A. K.

1/1

- 25 -

USSR   UDC   621.371.3.029.7

BISYARIN, V. P., BISYARINA, I. P., RUDASH, V. K., SOKOLOV, A. V.

"On the Problem of Attenuation of Laser Emission on Wavelengths of 10.6 and 0.63 μ in Atmospheric Precipitation"

Abstract: The paper presents the results of simultaneous measurements of coefficients of attenuation of laser emission on wavelengths of 10.6 and 0.63 μ in snow, rain and drizzle which were made on a transmission path of 1.36 km in length. It is shown that attenuation on 10.6 μ exceeds that on 0.63 μ by an average factor of 1.4 in snow, and by an average factor of 1.2 in drizzle. In the case of rain, experimental relations on both wavelengths for the coefficients of attenuation as functions of the intensity of the rain are compared with the relations calculated by Mie theory for the size distribution of the raindrops in accordance with the data of Best and Polyakova. It is shown that the attenuation on 10.6 μ is greater than on 0.63 μ in high-intensity rains. The authors thank M. A. Kolosov and Ye. V. Sukhonin for constructive discussion of the results of the work. Seven figures, bibliography of six titles.

1/1

USSR   .   UDC   621.373.826:550

BISYARIN, V. P., BISYARINA, I. P., and SOKOLOV, A. V.

"Recurrence of Attenuation Factors at Wavelengths of 0.63 and 10.6
Microns in the Atmosphere"

Moscow, V sb. X Vses. konf. po rasprostr. radiovoln. Tezisy dokl.
(Tenth All-Union Conference on the Propagation of Radio Waves;
Report Theses--collection of works) "Nauka," 1972, pp 174-178 (from
RZh--Radiotekhnika, No 10, 1972, Abstract No 10D378)

Translation: Estimation of the recurrence of attenuation factors
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orology makes the principal contribution to radiation attenuation.
Weakening of the 10.6 micron radiation, caused by molecular absorp-
tion, is comparable to fog attenuation. A. K.

1/1

- 25 -

USSR

UDC   621.371.3.029.7

BISYARIN, V. P., BISYARINA, I. P., RUDASH, V. K., SOKOLOV, A. V.

"On the Problem of Attenuation of Laser Emission on Wavelengths of 10.6 and 0.63 μ in Atmospheric Precipitation"

Moscow, Radiotekhnika i Elektronika, Vol 16, No 10, Oct 71, pp 1765-1769

Abstract: The paper presents the results of simultaneous measurements of coefficients of attenuation of laser emission on wavelengths of 10.6 and 0.63 μ in snow, rain and drizzle which were made on a transmission path of 1.36 km in length. It is shown that attenuation on 10.6 μ exceeds that on 0.63 μ by an average factor of 1.4 in snow, and by an average factor of 1.2 in drizzle. In the case of rain, experimental relations on both wavelengths for the coefficients of attenuation as functions of the intensity of the rain are compared with the relations calculated by Mie theory for the size distribution of the raindrops in accordance with the data of Best and Polyakova. It is shown that the attenuation on 10.6 μ is greater than on 0.63 μ in high-intensity rains. The authors thank M. A. Kolosov and Ye. V. Sukhonin for constructive discussion of the results of the work. Seven figures, bibliography of six titles.

1/1

- 81 -

USSR   UDC   621.371.3.029.7

BISYARIN, V. P., BISYARINA, I. P., SOKOLOV, A. V.

"On the Problem of Attenuation of Laser Emission on a Wavelength of 10.6μ in Artificial and Natural Mists"

Moscow, Radiotekhnika i Elektronika, Vol 16, No 10, Oct 71, pp 1758-1764.

Abstract: The paper gives the results of measurements of the coefficients of attenuation of laser emission on a wavelength of 10.6 μ in artificial and natural mists on transmission paths of 15 m and 1.36 km respectively. Experimental relations are presented for attenuation on 10.6 μ as a function of the attenuation on 0.63 μ and the meteorological visibility. It is shown that attenuation on a wavelength of 10.6 μ is in many instances less than the attenuation on 0.63 μ, and depends appreciably on the micro-structure of the mist, which is in accord with the theoretical calculations. Estimates of mist characteristics are given for both cases, which show that the man-made mists are close to natural fog. Seven figures, one table, bibliography of ten titles.

1/1

USSR   UDC 616.981.42=053.2

BISYARINA, V. P.

Brutsellez u Detey (Brucellosis Among Children), Moscow, "Meditsina," 1971,
176 pp

1/3

USSR

BISYARINA, V. P., Brutsellez u Detey, Moscow, "Meditsina," 1971, 176 pp

2/3

USSR

BISYARINA, V. P., Brutsellez u Detey, Moscow, "Meditsina," 1971, 176 pp

3/3

USSR

NEYLAND, O. Ya., KALNIN', S. V., and BITE, Dz. V., Riga Polytechnic Institute,
Riga

UDC 547,447+547,233+547,821+541,651

"Acid-Base and Tautomeric Equilibria of Some New Derivatives of 1,3-Indandione"

Riga, Izvestiya Akademii Nauk Latviyskoy SSR, Seriya Khimicheskaya, No 6, 1970,
pp 739-740

Abstract: The prototropic transformations of 1,3-indandione with onium sub-
stituents were studied. The betaine of 2-trimethylammanium-1,3-indandione
(I, m. pt. 196-8°) was prepared by the action of Me_2SO_4 on 2-amino-1,3-ind-
andione hexachlorostannate. By alkylating with Me_2SO_4 2-methylthio-1,3-
-indandione in a KOH solution, the betaine of 2-dimethylsulfonium-1,3-indand-
ione (II; m. pt. 189-90°, lit. 190°) was obtained. The acidity and tautomeric
equilibrium constants of I and II were determined and compared with those of
1,3-indandione and of 2-pyridinium, 2-methylthio, and 2-chloro-1,3-indandione
(table). The constants based on measurements of protolysis in H_2O and EtOH
characterized the C-acidity. Among onium substituents the greatest effect on
the acidity was exerted by the SMe_2 group. The SMe group also exerted a con-
siderable effect. The action of these two substituents can be explained by
1/2

USSR

NEYLAND, O. Ya., et al, Izvestiya Akademii Nauk Latviyskoy SSR, Seriya
Khimicheskaya, No 6, 1970, pp 739-740

the participation of unfilled d-orbitals of the S-atom in the delocalization
of the electron in the anion formed by the substituted compound.

2/2

Corrosion

KUZ'MIN, G. S., Candidate of Technical Sciences, and BITINSKAYA, L. N.,
Engineer, Perm Polytechnic Institute

"Influence of Alloying Elements on Corrosion Resistance of Monel Alloy Welded
Joints"

Abstract: Results are presented from a study of the influence of alloying
of moneltype metals with aluminum, titanium, and manganese on the structure
and corrosion resistance of welded joints in gaseous hydrogen fluoride. The
corrosion resistance of these welded joints depends to a significant extent
on the type and quantity of alloying elements introduced to the seam metal.
Alloying with aluminum (up to 0.45%) causes some increase in corrosion rate,
while greater aluminum contents results in a decrease. As titanium is
introduced, the corrosion rate increases continually. A significant decrease
in the corrosion rate is observed as the content of magnesium in the seams
is increased.

1/1

USSR   UDC 669.71.053.4.094

LEYTEYZEN, M. G., BITNER, A. A.

"Obtaining Well-Precipitating Sludge after Leaching High-Silicon, Low-Iron Bauxite"

Translation: The precipitability of slurries after leaching high-silicon, low-iron bauxites in the successive Bayer-sintering system is investigated. Laboratory and experimental-plant tests have established the dependence of the precipitability of the slurry on the conditions of formation of the first batches of hydroalumosilicate. A procedure is proposed for accelerating the process of precipitating red slurries by seed crystallization of sodium hydroalumosilicate. There are 2 illustrations.

1/1

- 13 -

BITS', YU. V., and KOZHURA, I. M., Chair of Pathological Physiology, Kiev
Medical Institute and Laboratory of Pathological Physiology Institute of
Geronotology, Academy of Sciences, Ukrainian SSR, Kiev

"Some Disturbances in Lipid Metabolism Resulting From Exposure to Some Toxic
Agents"

Abstract: Some indices of lipid metabolism were studied in the blood serum of
adult rabbits after subacute, acute, and chronic poisoning with propyl
gallate, sodium fluoride, monoiodoacetic acid, and granosan. Changes in
cholesterol and cholesterol fractions, total lipids, and beta lipoproteins
tended to increase, the extent varying both with the particular compound
administered and with the dose and duration of the poisoning. The mechanism
of the resulting changes in lipid metabolism are considered in relation to the
accompanying disturbances in carbohydrate metabolism. There is also a brief
discussion of the part played by intoxication in the origin of degenerative
vascular changes.

1/1

1/2   009   UNCLASSIFIED   PROCESSING DATE--27NOV70
TITLE--ON THE THEORY OF MIXED TYPE EQUATIONS -U-

AUTHOR--BITSADZE, A.V.

COUNTRY OF INFO--USSR

SOURCE--MINSK, DIFFERENTSIAL 'NYYE URAVNENIYA (DIFFERENTIAL EQUATIONS),
   VOL VI, NO. 1, 1970, PP 3-6
DATE PUBLISHED-------70

SUBJECT AREAS--MATHEMATICAL SCIENCES

TOPIC TAGS--VECTOR, BOUNDARY VALUE PROBLEM, INTEGRAL EQUATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3003/0264   STEP NO--UR/0376/70/006/001/0003/0006

CIRC ACCESSION NO--AP0129498
                         UNCLASSIFIED

CIRC ACCESSION NO--AP0129498

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ARTICLE CONCERNS THE PROBLEM
OF FINDING A COMPLEX VARIABLE Z EQUALS X PLUS IY OF VECOTR U(Z),
CONTINUOUS AND BOUNDED IN PLANE D SUBO, WHICH IS A SOLUTION OF THE
EQUATION, SHOWN ON MICROFICHE, EVERYWHERE IN D SUBO EXCEPT IN THE
NEIGHBORHOOD IN THE MAGNITUDE OF Z EQUALS 1 AND SATISFIES THE BOUNDARY
CONDITION, SHOWN IN MICROFICHE, WHERE F IS A REAL FUNCTION WHOSE FIRST
DERIVATIVE SATISFIES THE HOLDER CONDITION. THE SOLUTION IS REDUCIBLE TO
AN EQUIVALENT HOMOGENEOUS SINGUALR INTEGRAL EQUATION, BUT COMPLICATIONS
ARISE BECAUSE OF ADDITIONAL REQUIREMENTS IMPOSED ON THE SOLUTION OF THE
BOUNDARY VALUE PROBLEMS.

MATHEMATICS
Differential & Integral Equations

USSR

UDC 517.955.6

BITSADZE, A. V. (Institute of Mathematics Siberian Department Academy of Sciences USSR)

"On the Theory of Mixed Type Equations"

Abstract: The article concerns the problem of finding a complex variable $z = x + iy$ of vector $u(z)$, continuous and bounded in plane D_0, which is a solution of the equation

$$u_x + bu_y = 0, \qquad b = \begin{pmatrix} 0 & -1 \\ \text{sgn}(|z| - 1) & 0 \end{pmatrix},$$

everywhere in D_0 except in the neighborhood $|z| = 1$ and satisfies the boundary condition

1/2

USSR

BITSADZE, A. V., Differentsial'nyye Uravneniya (Differential Equations), Vol VI, No 1, 1970, pp 3-6

$$u_1|_{y = x} = f(x), \quad x \in \left[\frac{-1}{\sqrt{2}}, \frac{1}{\sqrt{2}}\right],$$

where f is a real function whose first derivative satisfies the Hölder condition. The solution is reducible to an equivalent homogeneous singular integral equation, but complications arise because of additional requirements imposed on the solution of the boundary value problems.

Orig. art. has 5 refs.

2/2

USSR   UDC: 621.791.3

ATAMANOV, V. N., Candidate Technical Sciences; BITSOYEV, G. D.
and ISAYEV, A. P., Engineers

"Equipment and Technique for Welding Integrated Circuit Leads to
Printed Circuit Plates"

Abstract: At the present time, solder with a low melting point
and flux is used for attaching integrated circuit leads to print-
ed circuit plates in industrial procedures. However, a number of
difficulties are involved in this method, and there is a tendency
to replace it with better welding processes such as the one pro
posed in this article. The basic principle here is that the volt-
age on the welding electrodes is automatically controlled, and
the increase or decrease in the cross sections of the elements to
be joined are automatically compensated by the increase or de-
crease in the welding current. The full schematic of the equip-
ment is given in the article together with details of the best
use of the method for various materials to be welded. The authors
conclude that this new method forms stable joints with nickel
printed-circuit leads.

1/1

USSR   UDC 532.57+532.137+536.51+532.14.08+531.787

SUDAKOV, P. YE., BITSUTA, V. K.

"Development and Investigation of a Viscosimeter for Continuous Measurement of Viscosity in a Flow"

Tr. Groznen. neft. in-t (Works of Groznenskiy Petroleum Institute), 1971, Collection 33, pp 196-197 (from RZh-Mekhanika, No 12, Dec 71, Abstract No 12B1633)

Translation: The design of a capillary viscosimeter for continuous monitoring and control of the viscosity of petroleum products in a flow is described. The viscosimeter consists of a capillary with a carefully polished surface into which the oil enters from the oil pipe with the aid of a semiplunger pump providing a constant supply. The pressure is taken with the aid of a differential manometer in a measuring section of the capillary and the manometer is connected through separating vessels. The differential manometer is connected with a secondary indicator graduated in viscosity units. A temperature compensation method is proposed for measuring viscosity under industrial conditions with an error of less than ±0.4 centistoke. The method is based on continuous correction of the indicator of the secondary instrument with the aid of a measuring sylphon through expansion of the measuring material contained in the cylinder of the thermomanometer system. The cylinder is placed in the flow of the product being studied. I. G. Bulina.
1/1

USSR   UDC: 621.391:621.317

BITUS, A. K., OVSYANNIKOV, V. A.

"Using Haar Functions to Measure the Law of Probability Distribution of Random Processes"

Dokl. Vses. nauchno-tekhn. konferentsii po radiotekhn. izmereniyam. T. 3 (Reports of the All-Union Scientific and Technical Conference on Radio Engineering Measurements. Vol. 3), Novosibirsk, 1970, pp 18-20 (from RZh-Radiotekhnika, No 12, Dec 70, Abstract No 12A306)

Translation: The authors examine a method of plotting histograms for the distribution of interference amplitudes with irregular quantization of levels. Analysis of the distribution function is based on expanding it in a series in orthogonal functions, this expansion being treated as the algorithm of a measuring instrument. The circuit which realizes this algorithm is given; the system is essentially a single-program computer which can be made either in digital or analog form. An oscilloscope with persistence is used to register the distribution function. One illustration, bibliography of two titles. N. S.

1/1

USSR   UDC 621.314.61 (088.8)

KOSTROV, M.N., BITYAY, K.G.

"Push-Pull Device For Phase Control Of A Thyristorized Converter"

USSR Author's Certificate No 255223, filed 22 July 68, published 26 Mar 70 (from RZh--Elektronika i yeye primeneniye, No 4, April 1971, Abstract No 4B668P)

Translation: A circuit is proposed for phase control of a thyristorized converter with rectifier and inverter groups of [semiconductor]rectifiers. Two pulse shapers are used in the circuit, operating in antiphase. Each of the shapers contains a charging capacitor, a discharging dynistor, and output pulse transformers, the primary winding of which is connected into the discharge circuit of the capacitors. A special feature of the proposed device is the handling of the charging circuit of the capacitors. The capacitors are charged across two electron tubes connected in the circuit of a balance amplifier. 1 ill. L.R.

1/1

- 12 -

USSR   UDC: 621.372.413

BITYURIN, Yu. A., PAVEL'YEV, V. G., TSIMRING, Sh. Ye.

"Equivalent Resistance of a System of Two Resonators"

Translation: A system of two resonarots coupled through slots is considered. Relationships are given which define the resonance frequencies and equivalent impedance reduced to the coupling slots. Numerical evaluations show that the values of the equivalent impedance in the case of tuned slots are comparable with the corresponding values in the interaction spaces of hollow resonators used in klystrons for the centimeter range. Data are given from experimental studies of a system of coupled open resonators with spherical reflectors. Five illustrations, bibliography of eight titles. Resumé.

1/1

USSR

BITYUTSKIY, V. I.; KAMENSKIY, G. A. (Moscow)

"Evaluation of the Mean Time to Servo Failure in a Nonlinear, Pulsed Servo System with Irregular Signals"

ABSTRACT: For nonlinear servo systems with discrete, irregular data input the authors obtain integral equations with a varying argument whose solution is the mean time to servo failure, the time depending on the initial value of the error in the system. The calculations allow for the effect of processes whereby the failure signals are detected or recognized. Methods of solving the initial and boundary value problems for the integral equations obtained are described, and existence and uniqueness theorems for their solution are discussed. An example is given.

1/1

USSR   UDC 577.4

BITYUTSKIY, V. P.

"Synthesis in Band Structures"

Sintez v lentochnykh strukturakh (Synthesis in Band Structures), Institute of
Mathematics and Mechanics of the USSR Academy of Sciences, Sverdlovsk, 1971,
14 pp., ill., 1-entry bibliography, No 3654-71 Dep (from RZh-Kibernetika, No 9,
Sep 72, Abstract No 9V428)

Translation: The problem of implementing logical devices in band structures is
solved as the problem of expressing the representation from a symmetric half-
group by the product of representations from the given generating set. Various
algorithms are proposed for solving this problem under the condition that the
generating sets are realized on the simplest cascades of band structures. These
algorithms are a step-by-step procedure for constructing the solution. Reports
are presented on machine programs.

1/1

TITLE--COMMUTATION EFFECT IN BISMUTH TYPE SEMIMETALS -U-

AUTHOR-(04)-BIVOL, V.G., BODIUL, P.P., FEDORKO, A.S., GITSU, D.V.

COUNTRY OF INFO--USSR

SOURCE--PHYSICA STATUS SOLIDI, 1970, VOL 37, NR 2, PP 545-550

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS, PHYSICS

TOPIC TAGS--BISMUTH, BISMUTH ALLOY, ELECTROMOTIVE FORCE, MAGNETIC FIELD
  EFFECT, ANISOTROPY, HIGH TEMPERATURE EFFECT, ENERGY BAND STRUCTURE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1989/0628   STEP NO--GE/0030/70/037/002/0545/0550

CIRC ACCESSION NO--AP0107225
                        UNCLASSIFIED

CIRC ACCESSION NO--AP0107225

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE DEPENDENCE OF THE NERNST
ETTINGSHAUSEN LONGITUDINAL EFFECT ON THE DIRECTION OF THE MAGNETIC FIELD
FOR THE CASE OF SEMIMETALS IS STUDIED THEORETICALLY AND EXPERIMENTALLY.
A QUITE UNIQUE CORRESPONDENCE IS FOUND BETWEEN THE ANISOTROPY OF THE
EFFECT AND THE BAND STRUCTURE NEAR THE FERMI LEVEL. IT IS SHOWN THAT
THE COMMUTATION EFFECT WHICH DETERMINES THE DEPENDENCE OF THE MAGNETO
THERMO E.M.F. MAGNITUDE ON THE DIRECTION OF THE INDUCTION VECTOR,
PERMITS TO JUDGE ABOUT THE NUMBER AND LOCALIZATION OF BAND EXTREMA IN
THE K SPACE. THIS IS AN EFFECTIVE WAY FOR STUDYING BAND STRUCTURES OF
BISMUTH AND ITS ALLOYS AT HIGH TEMPERATURES.

UNCLASSIFIED

USSR   UDC 627.8.05.69.055;624.147

BIYANOV, G. F., (Engineer), KAMENSKIY, R. M., (Candidate of Technical
Sciences), and PAVLENKO, YU. G., (Engineer)

"Ice Crossing for Heavy Loads Under Conditions of the Extreme North"

Abstract: The organization and execution of an ice crossing of a river
for transportation of heavy loads (power transformers) during construction
of the Vilyuy river hydroelectric power plant are described. Calculations
of the ice cover load carrying capacity were carried out by using the method
of the theory of elasticity on the basis of data on systematical natural
observations of the ice cover conditions, conducted by the Vilyuy Scientific
Research Meteorological Station of the Institute of Geocryology of the
Siberian Department of AN SSSR. Test conducted on an experimental crossing
100 m downstream from the main crossing confirmed the correctness and
reliability of design methods for determining the admissible load for one-
time transportation of heavy loads.

1/1

USSR

UDC: 51:621.391

BIYASHEV, R. G., POLOSUKHIN, B. M.

"Using Nonpositional Polynomial Coding Over Galois Fields for Checking During Storage or Transmission of Information"

Sb. nauch. tr. po probl. mikroelektron. Mosk. in-t elektron. tekhn. (Collected Scientific Works on Problems of Microelectronics. Moscow Institute of Electronic Technology), 1972, vyp. 9. (Physics and Mathematics Series), pp 217-222 (from RZh-Kibernetika, No 10, Oct 72, abstract No 10V454)

[No abstract]

1/1

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USSR

UDC: 681.3

BIYASHEV, R. G.

"Detection and Correction of a Double Error in Nonpositional Form"

Translation: The paper deals with a method of detecting and correcting a double error in a system of residual classes with polynomial bases in the presence of four control bases. The bases in which the errors took place and the magnitudes of the errors are found by solving a system of four equations modulo the control base. Author's abstract.

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USSR   UDC   517.9

BIYBOSUNOV, I., RYSKULOV, A., Frunze

"Numerical Solution of the Generalized Problem of Near Sonic Gas Flow
Around a Body"

Abstract: When a stream of gases flows around a body at a high subsonic
velocity, localized regions of supersonic velocities are set up near the
body if the velocity of the oncoming flow is sufficiently great. These
regions are bounded downstream by compression shocks which terminate
within the flow. In this paper the method of straight lines is used to
find an approximate solution of the problem of flow around a profile where
the localized supersonic zone is closed downstream by a straight com-
pression shock. Cases of absence of circulation are examined. The solu-
tion is found for symmetric and asymmetric flow around a profile. The
numerical solution gives a profile very close to a rhombus with slight
rounding on the sides. The authors thank S. V. Fal'kovich for construc-
tive criticism.

1/1

USSR

BIYBOSUNOV, I., KARYBEKOV, N.

"Planar Transsonic Flow of Curved Shock Wave"

Moscow, Mekhanika Zhidkosti i Gaza, No 5, Sep-Oct 70, pp 78-83

Abstract: An example is studied of plane-parallel flow which
has zones of sub- and supersonic velocities, divided by a shock
wave and transition line. The shock wave front approaches the
transition line at a right angle, separating a quadrant in the
physical plane where the flow velocity is subsonic. In the other
three quadrants, the velocity of a particle exceeds the speed of
sound, so that the flow cannot be used for the study of local
properties of the field of velocities in the classical problem
of termination of a shock wave on a transition line in a local
supersonic zone. In constructing the shock wave, the authors
used the method of perturbations; the desired quantities are
expanded into a series with respect to a small parameter.

1/1

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BIYELIS, I. YA.

XIII-8n. LIQUID HETEROEPITAXY BY THE ZONE MELTING METHOD

[Article by I. Ya. Biyelis, A. A. Patmalniyek, Riga; Novosibirsk, III Simpozium po Protsessam Rosta i Sinteza Poluprovodnikovykh Kristallov i Plenok, Russian, 12-17 June 1972, p 189]

In this paper a study was made of the thermal conditions of zone melting, for which it is possible to realize liquid heteroepitaxy.

It is demonstrated that the monocrystalline growth is caused both by the epitaxy process and by the process of lateral growth of the layer along the substrate.

The results are presented from a study of the liquid heteroepitaxy of Ge on Si and Si on SiC by the zone melting method.

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USSR

BIYELIS, I. Ya., PATMALNIYEKS, A. A., Latvian State University imeni P. Stuchka

UDC: 539.23

"Peculiarities of the Nucleation and Growth of Germanium and Silicon Thin Films Produced by Zone Melting"

Abstract: The paper presents some results of an investigation of the catalytic influence of substrate and points out some of the particulars of nucleation and growth of thin films of silicon and germanium made by the method of zone melting. It is found that the disorienting effect of the substrate can be qualitatively evaluated from the ratio of the work of adhesion W'_A of the system made up of the melt and the material being crystallized. to the work of adhesion W''_A of the system comprised of the melt and the substrate. The influence of the substrate increases with a reduction in this ratio. and becomes appreciable when W'_A/W''_A decreases to a value of the order of unity or less. Directional growth of a thin film with diamond lattice in the case of random multiple nucleation takes place in the form of banded

1/2

USSR

BIYELIS, I. Ya., PATMALNIYEKS, A. A., Izvestiya Akademii Nauk Latviyskoy SSR: Seriya Fizicheskikh i Tekhnicheskikh Nauk, No 5, 1972, pp 32-37

grains growing in direction <112> as a result of mutual rearrangement.   The method of zone melting can be used with a seed to grow single-crystal layers with a given orientation on unoriented, dissimilar substrates.

2/2

USSR   UDC [537.226+537.311.33]:[537+535]

GUBKIN, A. N., BIYEVETSKIY, E. A., CHARNOPOL'SKAYA, YE. T.

"Glass Electrets"

Translation: Correction methods and the properties of electrets of a pyroceramic
of various compositions (cordierite, glass-porcelain, and placopyroceramic) and
borosilicate glass with liquation are described. The physical nature of the
residual polarization in the glasses and the role of the heterogeneous structure
in the electret effect are discussed. Resume.

1/1

Surgery

KANDEL', E. I. and BIYEZIN', O. A., Institute of Neurology,
Academy of Medical Sciences USSR

"Cryosurgery of Brain Tumors in Man"

Abstract: Cryosurgery is gaining acceptance as a preferred
method for the treatment of brain tumors, because it is simpler,
faster, and yields equal or better results than conventional
surgery. The authors used an improved stereotaxic instrument
for cryosurgery of gliomas and meningiomas on 50 patients.
Cryoextirpation was performed on superficial tumors, cryodestruc-
tion on deep tumors, and a combination of both procedures was
used on diffuse nodular tumors. A long-term followup of the
patients revealed good results. Experimental studies were done
on laboratory animals to investigate postoperative histology.
It was found that cryodestruction is succeeded by dissolution and
resorption of the necrotized tumor, with subsequent formation
of a harmless cyst. Deep-freezing destroys capillaries, however,
without causing hemorrhages. Larger blood vessels with well
1/2

USSR

developed connective tissue in their walls are temporarily
blocked by ice thrombi; upon thawing, normal blood circulation
resumes. The method is promising and worthy of further investi-
gation and expansion.

2/2

Crystals & Semiconductors

BIYUSHKIN, V. N., BELOV, N. V., Institute of Crystallography, Academy of Sciences of the USSR, Mordov State University

"Structure-Localizing Cross Sections of the Doubled Patterson Function of the Second Kind"

Abstract: The introduction of two independent symmetry transformations to set the vector parameters of the doubled Patterson function defines the cross section which contains the representations of the structure in a fixed atom and in other atoms arranged in an analogous manner relative to the given elements of symmetry or pairs which are similar to them. The fixation of two elements considerably restricts the admissible regions for the reflecting atoms as compared with cross sections of the first kind.

1/1

AT0039749   NUCLEAR SCI ABST. 5-70   UR 0000

8134   THE PHASE COMPOSITION AND STRUCTURE OF
NICKEL-ALUMINUM ALLOY CATALYSTS WITH ADDITIONS
OF TITANIUM AND ZIRCONIUM. Bizhanov, F. B.; Sokol'skii,
D. V.; Khisametdinov, A. M.; Omarov, A. K.; Ongarbaev, S. O.
Tr. Inst. Khim. Akad. Nauk Kaz. SSR: 22: 127-37(1968). (In
Russian).

X-ray, metallographic, and chemical methods, as well as mea-
surements of total hardness and the microhardness of phases,
were used to study the phase composition and structure of catalyst
alloys, Ni-50% Al, with or without Ti and Zr additions. In the
preparation of catalysts, leaching of the alloys converted the Ni_2Al_3
and $NiAl_3$ phases into finely crystalline Ni with a fcc lattice. The
presence of Ti and Zr additions had some effect on the structure of
the Ni. (Referativnyi Zh.)

LD

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19741037

1/2   019   UNCLASSIFIED   PROCESSING DATE--30OCT70
TITLE--CATALYTIC AND ADSORPTION PROPERTIES OF MIXED CATALYSTS BASED ON
  NICKEL -U-
AUTHOR-(05)-KASIMOVA, G.I., BIZHANOV, F.B., SOKOLHSKIY, D.V., POPOV, N.I.,
  KHISAMETDINOV, Z.M.
COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK KAZ. SSR, SER. KHIM. 1970, 20(2), 20-4

DATE PUBLISHED------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--CATALYST ACTIVITY, NICKEL, MAGNESIUM OXIDE, HYDROGENATION,
  ORGANIC NITRO COMPOUND, PHENOL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--2000/2029   STEP NO--UR/0360/70/020/002/0020/0024

CIRC ACCESSION NO--AP0125617
                        UNCLASSIFIED

UNCLASSIFIED   PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0125617
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECT WAS STUDIED OF MGO
ADDNS. ON THE ACTIVITY OF A NI CATALYST. THE CARRIER:NI RATIO WAS
CONST., 4:1. THE ACTIVITY OF THE NI CATALYSTS FOR THE HYDROGENATION OF
O-NITROPHENOL INCREASED 2.5 TIMES UPON USING A CARRIER AND FOR THE ADDN.
OF MGO; THE OPTIMUM ADDN. BEING NI:MGO EQUALS 1:0.2. A COMPARISON OF
THE CATALYTIC AND ADSORPTION PROPERTIES SHOWED THAT THEIR CHANGES ARE
SYMBATIC. THE MAX. ACTIVITY WAS OBTAINED FOR SAMPLES REDUCED AT
250DEGREES FOR NI, AT 400-50DEGREES FOR THE NI:CLAY EQUALS 1:4 CATALYST,
AND AT 350-400DEGREES FOR THE NI:MGO CATALYST. FOR THE PROMOTED
CATALYST THE REACTION IS LIMITED BY THE ACTIVATION OF THE UNSATD. COMPD.
FACILITY: KAZ. KHIM.-TEKHNOL. INST., CHIMKENT, USSR.

UNCLASSIFIED

1/2   017   UNCLASSIFIED   PROCESSING DATE--27NOV70
TITLE--MONOSACCHARIDE HYDROGENATION CATALYST --U-

AUTHOR-(04)-SOKOLSKIY, D.V., YUNUSOV, U.I., BIZHANOV, F.B., KHISAMETDINOV,
A.M.
COUNTRY OF INFO--USSR

SOURCE--U.S.S.R 266,733
REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBRAZTSY, TOVARNYE ZNAKI 1970,
DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--SACCHARIDE, PATENT, CATALYTIC HYDROGENATION, CATALYST, NICKEL,
ALUMINUM, IRON

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3004/1792   STEP NO--UR/0482/70/000/000/0000/0000

CIRC ACCESSION NO--AA0132058
                         UNCLASSIFIED

CIRC ACCESSION NO--AA0132058
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A HYDROGENATION CATALYST FOR
  MONOSACCHARIDES CONSISTED OF NI, AL, AND FE, WITH 2 WT. PERCENT MN
  ADDED.   FACILITY: KAZAKH CHEMICAL TECHNOLOGICAL INSTITUTE.

UNCLASSIFIED

USSR

Antennas

UDC: 621.396.676.2(088.8)

FURMANOV, B. M., ZVORYGIN, A. S., BIZIN, P. S., and LIKHTMAN, L. M.

"Antenna"

/In-t gorn. dela im. A. A. Skochinskogo/ (The A. A. Skochinskiy Institute of Mining Affairs) Authors certificate USSR, class 21a 46/01, (H 01 q), No. 266864, Application 21.10.68, Publication 27.07.70 (from RZh-Radiotekhnika, No. 3, March 71, Abstract No. 3A293P)

Translation: For wireless   high-frequency communication in mines, inductive transmitting antennas have hitherto been used in the form of frames with or without cores, operating into unmatched loads and having low Q. To eliminate these deficiencies and increase the current, an antenna has been proposed in the form of two insulated sheets (e.g., paralonic) with electrically conducting layers (e.g., foil) between them. Such a layer is used as the plate of a capacitor, introduced in the tuned circuit of the transmitter, while the upper roof of the electric car storage cell is used as the other plate. Yu. V.

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